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SUMMARY OF NATIONAL PAPER*

This paper is prepared in an attempt to develop and present a Turkish view on the effective use of science and technology and related problems in development. The discussions, however, do not cover all relevant aspects. Actually, within the limits of 30 pages, as it is imposed to national papers, more could not be achieved. The problems that are investigated and discussed, obviously, are those risen in Turkish experience and hoped to be relevant to all humanity. Thus, this view should or could be taken, only as a part of a whole made up by the totality of national papers presented to this conference.

The method employed can be envisaged as made up three phases, as follows:

(a) Evaluation of the present state;

(b) Diagnoses of the problems;

(c) Recommendations for solution.

In each chapter of the paper, generally, all three phases are tried to be covered. In places, however, the analysis may stop short of recommendations or even diagnosis. Such incomplete analyses are presented whenever considered useful. In order to sharpen the views, at times, soft statements are avoided where we have even run into the risk of exaggeration.

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* The designations employed, the presentation of material and the views expressed in this paper are those of the Government of Turkey and do not necessarily reflect the practices and views of the Secretariat of the United Nations in any of these respects.

Today, there exists an enormous amount of knowledge and technology accumulated on the earth, and the science system has developed a tremendous potential to generate new knowledge and technology. But this accumulation and potential are not being used effectively for the development of mankind, in general, and of under-developed societies in particular. One can enumerate several reasons for this, but all can be subsumed under one fundamental reason that mankind has not reached a sufficient cognitive power to utilize this resource effectively. In this problem area, in fact, science remained under-developed, and stopped short in providing its support to man.

Inability of man to comprehend and utilize effectively the available resources, in general, science and technology, in particular, for his development, lies mainly in the problems associated with (a) ethics and (b) skill and power of rationality. Hence any solution or any recommendation thereof would be an appeal to ethics or rationality or both.

This conference by the implication of its title will be directed mostly to developing societies (countries). So called developed societies, however, face with very tough developmental problems too. Besides, the solutions of under-developed societies' problems heavily depend upon the developed ones, even more so than upon the former.

Essentially, today's main problems of the development of mankind, in general, under-developed countries, in particular, can be viewed as related to the utilization of

(a) Natural resources, and

(b) Existing potential of science and technology.

The solution of these problems concern the developed societies at least as much as, or more than, developing societies. Because, these resources, especially the second one, are under the control of developed countries. On the other hand, these countries developed themselves by a fast and wasteful depletion of natural resources, and they continue to do so. The share of a big under-developed mass of world population in the annual global consumption of natural resources constitutes only a minute fraction of the total. They do not have the economic power, let alone other incapacities, to consume an adequate amount to develop themselves in the face of mounting prices as a result of this enormous demand forced into the market by those affluent societies. It appears that if this process continues as it is, the developing nations may never have a chance. This problem constitutes one of the main challenges to science and technology. Finding ways and means to stop this wasteful and unjustly imbalanced consumption, and to reduce the heavy demand on natural resources without jeopardizing the standards achieved by the developed societies is at issue. There must be a way of life giving more happiness to humanity but not so much demanding on material resources. Similarly, the attitude of affluent societies has at least as much share in the ineffectiveness of the use of science and technology for the development of under-developed societies as the incapacity of the latter.

The gamut of intricate problems related to developing societies, on the other hand, may be subsumed in the fundamental problem as can briefly be stated as follows:

> "An underdeveloped society can be viewed as a social system which is ineffective and inefficient in its actions and its decisions. This characteristic is more pronounced in its science-technology subsystem, and yet this subsystem is desired to be made a driving force to convert its super system into an effective and efficient one. In order to achieve this, then the following question must be answered. How can one develop an effective and efficient science-technology subsystem in an ineffective and inefficient (underdeveloped) society? The difficulty lies in the adverse effect inflicted upon it by its super system, the underdeveloped society, since they are strongly interacting. This adverse effect can perhaps be compensated hopefully by a favorable influence of the environment formed by developed societies."

As can be seen from the above discussion, the problem of development cannot be solved on national level, since it is a problem of whole humanity, and its solution requires an international co-operation and collaboration. The world society has recognized this, and has been making continuous attempts last 30 years, unfortunately, however, without much success.

The majority, of international activities in this area have had a little favourable effect or none, or at times, even unfavourable one. In our view, there are two main reasons for this state of affairs.

(a) Wrong diagnoses and therefore ineffective solutions implemented for the problems of co-operation and collaboration;

(b) Constraining attitudes of developed societies in such activities due to their concern about their short-term interests and objectives.

Thus in order to make the international co-operation and collaboration effective for development, (a) both developed and under-developed societies must develop an understanding of the problems and a skill for their solution (the rationality question), and (b) developed societies must learn to sacrifice their short-term interests and objectives for the sake of the short-term benefits to under-developed societies and the longer benefits to all (ethical and rationality question) [1], or else we all must be prepared to face a likely catastrophe for humanity.

Industrialization is the most important part of development process, and technology is its basis and motive power. Developed societies have exploited the potentials of technological development to a great extent, although they have created serious problems due to its misuse. Under-developed societies, on the other hand, could not have come to the grips of this prolific resource as yet. They recognized its value, but they cannot harness it fully to the benefit of their salvation, since they do not know how. Developed societies, which hold control of it, on the other hand, do not let the access to it. This state of affairs, although a bit exaggerated, is a concise description of the situation, and seems

quite hopeless. But one must not be so pessimistic. With determination, willingness and wisdom, salvation of mankind can ultimately be achieved, provided the problems are understood, and the solutions discovered and implemented.

Every country has to purchase technologies, even if it has the capability to develop as such. Developing nations, on the other hand, have to rely solely on technologies transferred from industrialized countries in the development of their industry, until they develop their own technology generating capabilities.

The choice and transfer of technology is an important, but very difficult stage for developing countries, and is not being done effectively to achieve development rapidly. On the top of many reasons of this, is the lack of knowledge and information due to

(a) lack or ineffectiveness of technological information system;

(b) lack or inadequacy of studies on existing technologies;

(c) blockade imposed on technologies by the proprietors, even on the information that they exist.

Another reason is the lack of skill of decision making, and ineffectiveness or non-existence of such decision-making systems and methods. Such is more difficult for developing countries for a fundamental reason, namely, that available technologies over which the choice is to be made, are developed according to the perceived needs and socio-economic conditions of developed countries which are drastically different from those of developing countries.

The solution of the problems of the transfer of technology need a powerful and effective institutional set up, both on national and international levels. First of all, developing countries should develop an institutional structure to achieve the following objectives.

(a) To develop and formulate a technology policy consistent with national development policy and plan;

(b) To implement such a policy effectively;

(c) To develop and enhance the knowledge and skill of the industrial institutions and their personnel to achieve an effective transfer of technology;

(d) To support and protect such institutions in the transfer of technology transactions.

In spite of declarations of good intentions and even offer of generous financial support, the tremendous potential of science and technology under the control of developed countries could not be exploited to the benefit of developing countries so far. One of the most common activities so far have been the so-called technical assistance programmes, with fairly generous budgets, offered by the developed countries. In those programmes, which generally provide expert

services, a big portion of the money, man hours and effort goes down the drain, because the programmes and their implementations are not well thought out. These need serious studies before they are put into effect. Without speculating about the reasons of this setback, one can offer a short suggestion about how one can make such expert missions useful. The basic rule is simply this: "Help them to solve their problems themselves." To clarify the point a bit further, the following conditions can be thought as necessary.

(a) There should be an organized effort going on on the problem when the expert arrives.

(b) The expert should answer the questions asked by the local people who are working on the problem concerned. Obviously these latter, should be in a state of maturation to be able to ask meaningful questions.

(c) Diagnosis should be made by the local people possibly with some contribution from the expert.

(d) The basic role of the expert should be to use his (her) knowledge of technology to answer the questions, and never interfere with the local politics.

The most useful part of the technical assistance programmes implemented so far, had been the training programmes of the professionals of developing countries, except their unfavourable effect in the form of the brain drain.

As far as the obstacles in the transfer of technology is concerned, the main problem is the attitude and behaviour of the private national and multinational firms who are the technology suppliers. Thus a most effective co-operation between the Governments of developed and developed countries could be in regulating these institutions in their transfer of technology transactions. The form of such a co-operative regulation could be bilateral and/or international agreements.

Another useful area of co-operation would be to strengthen the research capability of developing countries. In doing this, the problems of the science systems of developing countries, which are discussed in section III, should be taken into account. Most crucial of those are (a) difficulty in promoting research demand and (b) institutional deficiencies.

A favourable effect of well developed science systems on the deficient science systems of developing countries can be achieved by the co-operation of the following forms:

(a) Bilateral agreements for co-operation between similar research institutes which consist of conducting (a) joint research, (b) contract research awarded to either of the institutes by its counterpart and (c) exchange of research fellows.

(b) Establishment of joint research institutes in a participating developed country with equal authority of the partners in their management.

(c) Establishment of branches by well established research institutes in a developing country.

The co-operation and collaboration among developing countries may be made on the following three principles:

(a) To unite around common interests in solving common problems for mutual support;

(b) To benefit from each other's experience by the exchange of views and information;

(c) To establish jointly sponsored institutions (research institutes, an institute of technology etc.).

Following these principles a variety of forms of co-operation can be envisaged.

In view of the problems and suggested solutions for them, many existing international organizations can play a significant role, to make science and technology be used effectively. Among these, the United Nations, obviously, occupies a unique position, as it is the centre of hope for the solution of many problems of humanity. But it is experiencing difficulties in fulfilling the functions expected from it, especially for the developing countries. For example, the United Nations runs the largest body of technical assistance programmes, which are not immune from the ills of similar programmes run by developed countries. This also shows that, apparently it is difficult to determine the best and most effective ways to design and run international assistance programmes and projects.

The short-comings of such United Nations operations, as it seems, can be attributed to two deficiencies.

(a) Institutional;

(b) Managerial.

Those two are obviously interacting.

These are apparently recognized and steps are already taken in the United Nations according to decision 32/197. If this process is taken seriously and the entire organization is improved and made effective, the United Nations will have a better chance to meet the expectations of humanity.

The United Nations role as a forum for all nations of the world, of course is the most important. Through a media of negotiations it leads to world-wide agreements which are sources of salvation for humanity.

Among such negotiations, relevant to this conference, are UNCTAD meetings discussing an issue, which is crucial to technological development, namely on establishing a so-called "Code of Conduct on Transfer of Technology", which is not concluded as yet. There are three alternative draft texts (documents TD/AC.1/9, annexes II, III and IV). It is hoped that through the slow and heavy machinery of the United Nations, it will some day come to a decisive conclusion, and Turkey hopes that it will be in the spirit of and in accordance with annex II.